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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/917,275	07/27/2001	Charles R. Broadus	4000.2.36	1219

32641 7590 10/19/2005

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EXAMINER

SHANNON, MICHAEL R

ART UNIT

PAPER NUMBER

2614

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/917,275

Applicant(s)

BROADUS ET AL.

Examiner

Michael R. Shannon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 July 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-58 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-58 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 20020916, 20021015.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-58 are rejected under 35 U.S.C. 103(a) as being unpatentable over August (USPN 5,671,267), cited by Examiner, in view of Hughes (USPN 6,931,123), cited by Examiner.

Regarding claim 1, the claimed "set top box [met by box 30 of Figure 1] for an interactive television system, the set top box configured to provide two-way communication using the interactive television system between a near-end user and a far-end user" is met as follows:

- The claimed "processor" is met by Control Unit 210 of Figure 2, which controls the functions of set top box 32 of Figure 5 (Figure 2 actually shows base unit 20, which, according to column 9, lines 48-52 is easily integrated into the set-top box 30 to form set-top box 32 of Figure 5).
- The claimed "wireless receiver coupled to the processor for communicating with a remote control" is met by antenna 214 and duplexer 215 which provide a wireless RF link to the handset unit 10 [Figure 2].
- The claimed "interface coupled to the processor for communicating with the far-end user" is met by the telephone circuit 211 [Figure 2].

- The claimed “noise cancellation module coupled to the wireless receiver and to the interface and having: a first input to receive TV audio output; a second input coupled to the receiver to receive input sound; and an adaptive filter to remove the TV audio output from the input sound based on an estimate of received TV audio output” is not expressly met by the August reference. The Hughes reference, however, teaches a canceller 62, with a first input to the $h(t)$ function from path 41 serving as the input to receive TV audio output. Furthermore, he teaches a second input $d(t)$ from microphone 12, which received input sound from the microphone. Lastly, he teaches adaptation techniques for forming adaptive filter $h(t)$, which uses synthetic modeling to subtract TV audio output from $d(t)$ to result in $e(t)$, $e(t)$ being the signal without echo from the TV audio [col. 2, lines 2-10 & Figure 3]. It would have been clearly obvious to one of ordinary skill in the art at the time of the invention to include this noise cancellation module, in order to avoid the echo signal returning to the source of the original signal [col. 1, lines 55-56] and because echo cancellation is a mature technology, and widely used in telecommunications—loud-speaking telephones, teleconference systems, network echo control, and data transmission [col. 2, lines 15-18].
- The claimed “memory coupled to the processor including: communication instructions for establishing two-way communication with the far-end user via the interactive television system” is met by the memory 136, as

discussed in column 5, lines 43-45, which allows for memory allocation, and in column 7, lines 60-63, which discusses the use of the memory 136 for storing dialing instructions, or instructions for how to communicate with a far-end person using the interactive television system discussed above.

Regarding claim 2, the claimed “set top box of claim 1, wherein the adaptive filter comprises adaptive filter program code resident in the memory” is not expressly met by the August reference. However, Hughes teaches inherent code or executable processes for carrying out the adaptive techniques such as the LMS, RLS, or AP algorithms [col. 2, lines 2-14]. It would have been clearly obvious to one of ordinary skill in the art at the time of the invention to include this noise cancellation module, in order to avoid the echo signal returning to the source of the original signal [col. 1, lines 55-56] and because echo cancellation is a mature technology, and widely used in telecommunications—loud-speaking telephones, teleconference systems, network echo control, and data transmission [col. 2, lines 15-18].

Regarding claim 3, the claimed “set top box of claim 1, wherein the adaptive filter comprises a digital signal processor coupled to the wireless receiver and to the interface with adaptive filter instructions”, again, is not expressly met by the August reference. However, Hughes teaches a DSP used for performing a fast adaptation algorithm [col. 3, lines 1-10]. It would have been clearly obvious to one of ordinary skill in the art at the time of the invention to include this noise cancellation module, in order to avoid the echo signal returning to the source of the original signal [col. 1, lines 55-56] and because echo cancellation is a mature technology, and widely used in telecommunications—

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loud-speaking telephones, teleconference systems, network echo control, and data transmission [col. 2, lines 15-18].

Regarding claim 4, the claimed “set top box of claim 1, wherein the adaptive filter comprises analog components coupled to the wireless receiver and to the interface” is met by combiner 90, which subtracts out the echo signal, as discussed in column 2, lines 2-10. Again, it would have been clearly obvious to one of ordinary skill in the art at the time of the invention to include this noise cancellation module, in order to avoid the echo signal returning to the source of the original signal [col. 1, lines 55-56] and because echo cancellation is a mature technology, and widely used in telecommunications—loud-speaking telephones, teleconference systems, network echo control, and data transmission [col. 2, lines 15-18].

Regarding claim 5, the claimed “set top box of claim 1, wherein the set top box further comprises a microphone configured to capture the input sound” is met by microphones 11 or 12 of the Hughes reference or microphone 122 of the August reference (though 122 is actually present in the handset unit 10).

Regarding claim 6, the claimed “set top box of claim 1, wherein the set top box is coupled to an output device for generating audible output” is met by speaker 21 or speaker 22 of the Hughes reference, or speaker 121 of the August reference (though, like microphone 122, speaker 121 is actually present in the handset unit 10).

Regarding claim 7, the claimed “set top box of claim 1 further comprising a training module coupled to the noise cancellation module and to the wireless receiver for training the adaptive filter to improve the estimate of received TV audio output” is

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met by the $h(t)$ adaptive function for driving $e(t)$ towards zero and adapting to the input signal using algorithms such as LMS, RLS, or AP [col. 2, lines 2-14].

Regarding claim 8, the claimed "set top box [met by box 30 of Figure 1] for an interactive television system, the set top box configured to provide two-way communication using the interactive television system between a near-end user and a far-end user" is met as follows:

- The claimed "processor" is met by Control Unit 210 of Figure 2, which controls the functions of set top box 32 of Figure 5 (Figure 2 actually shows base unit 20, which, according to column 9, lines 48-52 is easily integrated into the set-top box 30 to form set-top box 32 of Figure 5).
- The claimed "wireless receiver coupled to the processor for communicating with a remote control" is met by antenna 214 and duplexer 215 which provide a wireless RF link to the handset unit 10 [Figure 2].
- The claimed "interface coupled to the processor for communicating with the far-end user" is met by the telephone circuit 211 [Figure 2].
- The claimed "output suppression module coupled to the wireless receiver and to a TV audio output, the output suppression module having: a first input coupled to the receiver to receive input sound; a first output coupled to the TV audio output; and a near-end audio detector to detect near-end audio in the input sound and to suppress the TV audio output when the near-end audio is detected" is met by the output suppression accomplished through using the mute command in the August reference.

When it is detected that a user is talking into the speaker, output sound from the television is suppressed (using the mute function) until the speaking stops [col. 11, lines 3-18]. Furthermore, the echo suppression is also discussed in the Hughes reference, wherein echoes are prevented by only allowing signal transmission if the person in the room is speaking [col. 1, lines 56-65]. It would have been clearly obvious to one of ordinary skill in the art at the time of the invention to include this echo suppression module, in order to avoid the echo signal returning to the source of the original signal [col. 1, lines 55-56] and because echo cancellation is a mature technology, and widely used in telecommunications—loud-speaking telephones, teleconference systems, network echo control, and data transmission [col. 2, lines 15-18].

- The claimed “memory coupled to the processor including: communication instructions for establishing two-way communication with the far-end user via the interactive television system” is met by the memory 136, as discussed in column 5, lines 43-45, which allows for memory allocation, and in column 7, lines 60-63, which discusses the use of the memory 136 for storing dialing instructions, or instructions for how to communicate with a far-end person using the interactive television system discussed above.

Regarding claim 9, the claimed “set top box of claim 8, wherein the near-end audio detector comprises detecting code resident in the memory for detecting near-end audio in the input sound” is met by the decision algorithm for determining when a

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person in the room is speaking, and therefore, suppressing the echo by allowing signal transmission [Hughes, col. 1, lines 56-65].

Regarding claims 10-14, see the above rejections to similar claims 3-7.

Regarding claim 15, see the above rejection to similar claim 1. Also note that the handset unit 10 pictured in Figure 2 of the August reference has an antenna 119 and duplexer 117 for sending and receiving commands to and from the set-top box 32 over the RF link.

Regarding claims 16-21, see the above rejections to similar claims 2-7.

Regarding claim 22, the claimed "system of claim 15, wherein the remote control further comprises the following" is further met as follows:

- The claimed "microphone configured to capture the input sound for transmission to the set top box via the wireless transmitter" is met by microphone 122, which is eventually transmitted over RF link to base station 20 or set-top box 32 [col. 5, lines 7-20].
- The claimed "remote control wireless receiver configured to receive a far-end audio signal" is, again, met by the antenna 119 and duplexer 117 of handset unit 10, for receiving audio signals from the base unit 20 or set-top box 32 and sending the signals to the radio receiver 114 and outputting the audio to the speaker 121 [col. 5, lines 7-20].
- The claimed "remote control speaker configured to generate far-end audible output from the far-end audio signal" is, again, met by the speaker

121 for outputting audio signals received by the base unit 20 or set-top box 32 [col. 5, lines 7-20].

Regarding claim 23, the claimed "system of claim 22, wherein the remote control speaker and the microphone are further configured to operate simultaneously to provide two-way audio communication with the far-end user via the interactive television system" is met by the fact that the transmitter 113 and receiver 114 of Figure 2 can operate simultaneously [col. 5, lines 7-20].

Regarding claim 24, the claimed "system of claim 23, wherein the system further comprises a second speaker for generating television sound" is met by the fact that the television display device 60 contains a speaker to output audio relating to the program [col. 3, lines 13-25].

Regarding claim 25, the claimed "system of claim 24, wherein the set top box comprises a broadband communication component configured to initiate communication with the far-end user via a second interactive television system" is met by the Hughes reference, which points out the use of a audiovisual telecommunications system for transmitting conversations between different locations [col. 1, lines 6-10].

Regarding claim 26, the claimed "system of claim 24, wherein the set top box comprises an Internet communication component configured to initiate communication with the far-end user via the Internet" is not met explicitly by either the August reference or the Hughes reference. However, Hughes does suggest a telecommunications network comprised of data transmission networks [col. 2, line 18]. Since the Internet is a form of data transmission network, the Examiner takes OFFICIAL NOTICE that it is

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notoriously well known in the art that the Internet is the epitome of a data transmission network, and therefore submits that it would have been clearly obvious to one of ordinary skill in the art at the time of the invention to use the Internet in order to accomplish communication between a near-end user and a far-end user, as is done on a day-to-day basis.

Regarding claim 27, the claimed "system of claim 24, wherein the set top box comprises a telephone network component configured to initiate communication with the far-end user via a telephone network" is met by the POTS system used by the August reference to receive and transmit normal telephone calls [col. 6, lines 52-57].

Regarding claim 28, see the above rejection to similar claim 8. Also note that the handset unit 10 pictured in Figure 2 of the August reference has an antenna 119 and duplexer 117 for sending and receiving commands to and from the set-top box 32 over the RF link.

Regarding claims 29-34, see the above rejections to similar claims 9-14.

Regarding claims 35-40, see the above rejections to similar claims 22-27.

Regarding claims 41-46, see the above rejections to similar claims 15-24, including details of the noise cancellation.

Regarding claims 47-50, see the above rejections to similar claims 28-37, including details of the output suppression.

Regarding claim 51, see the above rejection to similar claims 15-24, including details of the noise cancellation.

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Regarding claim 52, see the above rejection to similar claims 28-37, including details of the output suppression.

Regarding claim 53, see the above rejection to similar claims 15-24, including details of the noise cancellation.

Regarding claim 54, see the above rejection to similar claims 28-37, including details of the output suppression.

Regarding claim 55, see the above rejection to similar claims 15-24, including details of the noise cancellation.

Regarding claim 56, see the above rejection to similar claims 28-37, including details of the output suppression.

Regarding claim 57, see the above rejection to similar claims 15-24, including details of the noise cancellation.

Regarding claim 58, see the above rejection to similar claims 15-24, including details of the noise cancellation.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. Doganata et al (USPN 6,772,436) disclose an interactive audio conferencing system.

b. Osovets (USPN 6,442,272) discloses another echo canceller in a teleconferencing system, with an adaptive filter.

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- c. Friedel et al (USPN 6,128,033) disclose another A/V communications teleconferencing system and method.
- d. Rodriguez et al (USPN 5,999,207) discloses a system for using a videophone in a cable TV network.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael R. Shannon who can be reached at (571) 272-7356 or Michael.Shannon@uspto.gov. The examiner can normally be reached by phone Monday through Friday 8:00 AM – 5:00PM, with alternate Friday's off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Miller, can be reached at (571) 272-7353.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to customer service whose telephone number is **(571) 272-2600**.

Michael R Shannon
Examiner
Art Unit 2614

Michael R Shannon
October 5, 2005



JOHN MILLER
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